NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003 - 4458

No. P 216-0058

Old	New
010	010
FIELD CODE	
00	00
AREA CODE	
30	30
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

Gas Storage
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Ventura, California
April 29, 2016

Amy Kitson, Agent
Southern California Gas Company (S4700)
12801 Tampa Ave., SC9382
Northridge, CA 91326

Your proposal to **Rework** well **"Porter" 72A**, A.P.I. No. **037-24145**, Section **27**, T. **03N**, R. **16W**, **SB** B. & M., **Aliso Canyon** field, **Any** area, **30** pool, **Los Angeles** County, dated **4/26/2016**, received **4/27/2016** has been examined in conjunction with records filed in this office. (Lat: **34.314696** Long: **-118.548646** Datum:**83**)

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
   a. Class **III 5M** on the **9 5/8"** casing.
2. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
3. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
4. A **Temperature and Noise log** are run on the well from the packer to the surface.
5. A **Casing Wall Thickness, Cement Bond Log, and a Multi-Arm Caliper Inspection** shall be performed to demonstrate the mechanical integrity of the **9 5/8**" casing.
6. Prior to commencing injection, a pressure test is conducted to demonstrate the mechanical integrity of the **9 5/8"** casing.
7. Injection shall be through the tubing and packer only. Injection withdrawal through the casing is not permitted.
8. This office shall be contacted by phone prior to making any program changes and no changes are made without Division approval.
9. **THIS DIVISION SHALL BE NOTIFIED TO:**
   a. Witness a test of the installed blowout prevention equipment prior to commencing **downhole** operations.
   b. Witness a pressure test of the **9 5/8"** casing prior to commencing injection.

Continued on Next Page

Blanket Bond Dated: 7/6/1999
UIC Project No. 0100006
cc:

Engineer Clifford R. Knight
Office (805) 654-4761

CRK/crk

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____
Paticia A. Abel, *District Deputy*

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

NOTE:

1. The base of the freshwater zone is approximately at **800'±**, or can be determined by logging.
2. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
3. This permit is being issued as part of Division Order No. 1109 dated March 4, 2016. Any well that fails any of the testing must be taken out of service and isolated from storage reservoir pursuant to the Safety Review Testing Regime.
4. The required History of Oil or Gas Well (OG103) shall include a complete description of the required pressure testing. **An updated casing and tubing diagram shall be included with the well history.**
5. **A Well Summary Report (Form OG 100)** and **Well History (Form OG 103)** shall be submitted to the Division within 60 days after the well is drilled, reworked, plugged and abandoned, or if the work is suspended. Any additional well work will require an additional notice to be submitted to this office prior to resuming well operations.

Enclosure: **Attachment 1 to DOGGR Order 1109. Safety Review Testing Regime for the Aliso Canyon Natural Gas Storage Facility.**

ATTACHMENT 1
TO DOGGR ORDER 1109

SAFETY REVIEW TESTING REGIME
FOR THE ALISO CANYON NATURAL GAS STORAGE FACILITY

This document identifies the requirements of this comprehensive safety review that shall be completed by the Southern California Gas Company (Operator) and verified by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division). The Operator shall use accepted industry practices and procedures.

The Division has consulted with independent technical experts from the Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories ("National Laboratories") to develop the requirements of this facility safety review. The National Laboratories experts independently reviewed and concurred with the testing requirements for the safety review detailed below.

This comprehensive safety review requires that each of the active injection wells in the Aliso Canyon Storage facility either pass a thorough battery of tests in order to resume gas injection or be taken out of operation and isolated from the underground gas storage reservoir. Several steps, detailed below, are required in this safety review. Documentation of all testing required under this comprehensive safety review shall be provided electronically to the Division within 72 hours of completion of a test in digital (i.e. LAS) and printed (i.e. pdf) form. All pressure tests required under this comprehensive safety review shall be witnessed by Division staff. A well that is properly plugged and abandoned in accordance with Public Resources Code section 3208 is not subject to testing under this comprehensive safety review. A well that does not pass all tests must be repaired, retested, and pass all tests, or be plug and abandoned.

REQUIRED TESTS FOR EACH WELL IN THE FACILITY

Step 1: The Operator shall perform an initial casing assessment on the well consisting of temperature and noise logs.

a. Temperature Log:
A temperature survey shall be run from the surface to the packer to measure the temperature within the wellbore. A temperature survey that demonstrates no unexplained anomalous temperature changes in the well is one indication of casing integrity.

b. Noise Log:
An acoustic sensor survey capable of detecting the sound of fluid flow will be conducted the length of the well above the packer to the surface. The survey will include stops at least every 250 feet and at the midpoint of any anomaly detected by the temperature survey. The absence of anomalous sound above the packer is an indication of well integrity

Step 2: The results of the Temperature Logs and Noise Logs will be independently reviewed by Division engineers. Any unexplained abnormal findings in this set of tests shall be addressed by the Operator in one of the following ways:

a. Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
b. Remediate the well to the Division's satisfaction; or
c. With Division review and approval, remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

Necessary actions to remediate any abnormalities revealed by these tests will be reviewed by Division engineers. Once repairs or mitigations are completed, the Temperature Log and Noise Log must then be repeated on the well and reviewed by Division engineers to ensure that there are no additional abnormal test results and to confirm the issue was repaired.

Step 3: After these tests are completed on the well, and all required action has been completed, the operator shall either:

a. Conduct the additional tests and evaluations on the well, outlined in Steps 4a through 7a below, in order to gain approval for injecting gas through that well; or
b. Remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

REQUIRED TESTS IF A WELL IS INTENDED TO RESUME OPERATIONS

If Temperature and Noise Logs have been completed on a well and they indicate well integrity, and the Operator designates the well to return to injection operations, then the Operator shall perform the additional testing outlined in Steps 4a through 7a. The results of these tests will be independently reviewed by Division engineers and posted publicly. Each of the following tests requires that the production tubing be removed from the well.

Step 4a: The Operator shall conduct a **Casing Inspection log.**
The Operator shall conduct a Casing Inspection log of the well that measures the thickness of the production casing, from the surface to the bottom of the gas storage reservoir cap rock. If the inspection reveals a reduction in wall thickness, the current minimum strength of the casing will be calculated. If the current minimum strength of the casing has diminished to the point that it cannot withstand authorized operating pressures for the well plus a built-in additional safety factor of pressure, the well has failed this test. *A passing test for a casing inspection log would show no thinning of the casing that diminishes the casing's ability to contain at least 115% of the well's maximum allowable operating pressure as authorized in the current Project Approval Letter.*

Step 5a: The Operator shall conduct a **Cement Bond Log** for the well.
The Operator shall conduct a Cement Bond Log (CBL) that measures the bonding between cement and the production casing of the well, and also the bonding between the annular cement and the formation. Cement should be solidly bonded to both the well's production casing and the geologic formation to ensure a seal that prevents fluids from migrating up or down the outside of the well. *A passing test for a cement bond log shows definitive bond, as demonstrated by sonic waveform,*

between cement and casing and between cement and the gas storage formation and/or cap rock for at least 100 feet above the top of the gas storage reservoir.

Step 6a: The Operator shall conduct a **Multi-Arm Caliper Inspection** of the well. The operator shall conduct an inspection that measures any internal degradation or significant changes to the well's geometry from the surface to the top of the gas storage reservoir, using a minimum 32-arm caliper tool. If the inspection reveals a thinning or deformity of the casing, the current strength of the casing will be calculated. If the current strength of the casing has diminished, such that it cannot withstand authorized operating pressures plus a built-in safety factor of additional pressure, the well fails this inspection. *A passing test for a Multi-Arm Caliper Inspection would show no deformation or thinning of the casing that diminishes the casing from being able to properly contain at least 115% of each well's maximum operating pressure.*

Step 7a: The Operator will conduct a **Pressure Test** of the production casing and of the well once the production tubing has been reinstalled. The Operator may conduct the casing pressure test prior to reinstalling the production tubing. Using a digital recorder, the operator will conduct a liquid-filled positive pressure test within the production tubing of the well, and in the annular space between the production tubing and the casing, to determine the well's ability to withstand normal operating pressures. The production tubing will be isolated and then pressure tested. The annular space between tubing and casing will be pressure tested. This testing also evaluates the integrity of any packers, which seal the annular space between the tubing and casing. The pressure test will be one hour and begin at a pressure of 115% of the maximum operating pressure or the minimum yield strength of the casing and tubing, whichever is less. *A passing pressure test is a pressure loss not exceeding 10% for any 30 minute period during the hour long test.*

After conducting the above tests, the Operator will conduct any indicated remediation so that the well can pass these tests. All remediation will be subject to the review of Division engineers. The well would then be required to undergo the tests once again to demonstrate well integrity.

If the well passes the Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper inspection and the Pressure Test to the Division's satisfaction, then the Division may clear the well for use for gas injections and withdrawal, once the Division has authorized resumption of injection into the gas storage reservoir. As noted below, wells approved for operation will only be permitted to inject or withdraw gas through the production tubing.

REQUIRED ACTIONS IF THE WELL IS TO BE TAKEN OUT OF OPERATION AND ISOLATED FROM THE GAS STORAGE RESERVOIR:

If the operator elects to take a well out of service, then the following steps shall be taken to isolate the well from the gas storage reservoir:

Step 4b: The Operator shall confirm the presence of cement outside the well's external casing in the section of the well that prevents the movement of gas from the underground gas storage reservoir to shallower geologic zones above the gas storage reservoir. Existing cement bond logs and well construction

records may be used to make this confirmation. This confirmation requires concurrence from Division engineers.

Step 5b: The Operator shall install a mechanical seal or "packer" within the well's production casing and install a mechanical plug within the well's production tubing, if applicable. These seals shall be set in place near the bottom of the well, within the portion of the well surrounded by cement. This kind of seal is an industry standard practice for isolating a well from reservoir gases or fluids and will further protect the casing from internal gas pressure.

Step 6b: The Operator shall fill the well with fluid to the well's surface in order to create appropriate downward hydrostatic pressure in the well that further contributes to the integrity of the well seal.

These measures will isolate a well from the underground gas reservoir, as confirmed by National Laboratory experts. Each of the above actions is subject to review and approval by Division Engineers.

Step 7b: Once the Operator has completed steps 4b, 5b, and 6b, and the seal is in place at the bottom of the well and the well is filled with fluid above the seal, the operator shall:

a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
b. Conduct noise log, temperature log and positive pressure test every six months;
c. Conduct weekly monitoring of fluid levels in the well or, install and operate real-time pressure monitors that provide immediate notification to the operator when pressures deviate from normal in the well's interior tubing and its annular space.

The above monitoring shall be reported to Division engineers and maintained as a part of the well file. Division engineers will review all submitted information for evaluation on a regular basis to ensure that the well taken out of service has maintained safety, and the operator shall take all necessary steps maintain the safety of the well.

Any well taken out of operation cannot be approved to resume operations and gas injection until the successful completion of the battery of tests outlined above in Steps 4a through 7a (Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper Extension and the Pressure Test) is completed. Those tests must be successfully completed within one year of completing step 6b. If a well cannot successfully complete all necessary steps required in this safety review after one year of completing step 6b, then the well shall be properly plugged and abandoned in accordance with Public Resources Code section 3208.

REQUIREMENTS FOR WELLS RESUMING OPERATIONS IN ALISO CANYON

The Division's authorization to resume injection in the Aliso Canyon Storage Facility will be contingent on the successful completion of this comprehensive safety review. The State Oil and Gas Supervisor must confirm in writing that all wells in the facility have either completed and passed the full battery of tests required in the safety review, been taken out of service and isolated from the underground gas storage reservoir, or been properly plugged and abandoned in accordance with Public Resources Code Section 3208.

NATURAL RESOURCES AGENCY OF CALIFORNIA
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FOR DIVISION USE ONLY		
	Forms	
Bond	~~OGD114~~	OGD121
	CALD WIMS	1151

P216-0058

NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog/

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework ☒ / redrill ☐ (Check one) well Porter 72A, API No. 037-24145,

Sec. 27, T. 3N, R. 16W, S.B. B.&M., Aliso Canyon Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)
See attached wellbore schematic

The total depth is: 7170 feet. The effective depth is: 7170 feet.

Present completion zone(s): Sesnon (Name). Anticipated completion zone(s): Same (Name).

Present zone pressure: storage psi. Anticipated/existing new zone pressure: storage psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes☐ No☒

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes☐ No☒ If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

See attached program

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: _____ feet _____ (Direction) and _____ feet _____ (Direction) Estimated true vertical depth: _____

Will the Field and/or Area change? Yes☐ No☒ If yes, specify New Field: _____ New Area: _____

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator: Southern California Gas Company			
Address: P. O. Box 2300		City/State: Chatsworth	Zip Code: 91313-2300
Name of Person Filing Notice: Mark Ghann-Amoah	Telephone Number: (806)401-2979	Signature	Date: 04/25/16
Individual to contact for technical questions: Mark Ghann-Amoah	Telephone Number: (806)401-2979	E-Mail Address: mghann-amoah@semprautilities.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

Rec'd 04-26-16 DOGGR Ventura.

INFORMATION FOR COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA)

If an environmental document has been prepared by the lead agency, submit a copy of the ***Notice of Determination*** or ***Notice of Exemption*** with this notice. Please note that a CEQA determination by a local jurisdiction, if required, must be complete, or the Division may not issue a permit.

CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), "Critical well" means a well within:

(1) 300 feet of the following:
  (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
  (B) Any airport runway.
(2) 100 feet of the following:
  (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
  (B) Any navigable body of water or watercourse perennially covered by water;
  (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
  (D) Any officially recognized wildlife preserve.

WELL OPERATIONS REQUIRING BONDING

1. Drilling, redrilling, or deepening any well.
2. Milling out or removing a casing or liner.
3. Running and cementing casing or tubing.
4. Running and cementing liners and inner liners.
5. Perforating casing in a previously unperforated interval for production, injection, testing, observation, or cementing purposes.
6. Drilling out any type of permanent plug.
7. Reentering an abandoned well having no bond.

This form may be printed from the DOGGR website at www.conservation.ca.gov/dog/

Rec'd 04-26-16 DOGGR Ventura.

WORKOVER PROJECT

(Porter 72A – Well Inspection)

DATE:	April 22, 2016
OPERATOR:	SOUTHERN CALIFORNIA GAS COMPANY
FIELD:	ALISO CANYON
PREPARED BY:	MARK GHANN-AMOAH
API NUMBER:	037-24145
ELEVATION:	All depths based on original KB, 23.5' above GL

OBJECTIVE

The intent of this program is to inspect the wells mechanical integrity and remediate identified conditions as part of the Storage Integrity Management Program (SIMP).
This project will include pulling the current production string, Pressure testing casing and well laterals, running casing inspection logs, installing a new completion string, converting well to tubing flow, and installing pressure monitors.

CASING & CEMENT RECORD

CSG. SIZE (INCHES)	TOP OF CSG (FT)	DEPTH OF SHOE(FT)	WEIGHT OF CASING(LBS)	GRADE & TYPE OF CSG.	HOLE SIZE (INCHES)	SACKS OF CMNT(CF)	CMNT TOP (FT)	TYPE OF CEMENT
13 - 3/8	0	814	54.5	K-55, STC	17 – 1/2	761	SURFACE	CLASS G
9 – 5/8	0	6899	47	N-80, LTC	12 – ¼	2604	SURFACE	CLASS G
5 – ½	6816	7170	17	K-55, WWS	15		GRAVEL	GRAVEL

WELL RECORD

Current Status:	Active	
C/O Depths:	PBTD - 7170' , Last tagged at 7168'(11/ 06/2015)	
Injection Conditions:	Estimated BHT – 135 F	Estimated WHP – 1200psi
Current Injection String:	3.5" 9.3# 0'/6770'w/GLM at 6662' , Sliding Sleeve – 6702', No-Go Nipple – 6734'(ID-2.635"), J-Latch Packer -6766' (See attached wellbore schematic for detailed description.	
Proposed Injection String:	See attached	

GEOLOGIC MARKERS

UDA1	5478'MD	
MP	6682'MD	6579' TVD
S1	6953'MD	6870' TVD
S2	6999'MD	6908' TVD
S4	7054'MD	6954' TVD

WELL WORK HISTORY/ANALYSIS

This well was drilled and completed in 1994. Last production data – 1/1/2016 showed that well produced 67bopd, 82bwpd and 384MMCF/D with a recorded casing and tubing pressure of 895psi.
It passed noise and temperature log(1 3/8"OD) ran on 3/20/2016 with a tag depth at 7160'. Temperature survey ran 11/06/2015 showed tubing and casing pressure of 2745psi. The tag depth was recorded to be 7168'(PBTD-7170'). Data shows 8' of fill from 11/06/2015 to 3/20/2016, thus it will be prudent to retag and cleanout well. Also, let monitor type of fill to ensure its not pea gravel.
Drilling information from drilling dailies on DOGGR well records shows that drill pipe was stuck at 5347'(spotted oil). However, pipe was successfully recovered and well was directionally drilled to 6002'. There is a gyro ran record in the DOGGR records.
There no documented rig work since well was drilled but caliper log ran in December, 1993 shows the original liner was pulled and replaced.

PROJECT NOTES

1. BOPE requirements in Gas Company Standard 224.05 shall be fully implemented at all times.

2. The storage reservoir pressures shall be monitored during the workover with a minimum of 300 psig overbalance for well control fluids.

3. Prepare the location by removing all relevant landscaping/lighting fixtures as well as surface piping and electrical components as needed. Locate rig anchors, reinstall if necessary.

4. DOGGR permit must be posted on site. Notify the DOGGR as required for BOPE testing as stated on permit.

PRE-RIG WORK(FOLLOW CURRENT SOP)

1. De-energize and remove all laterals.
   → Install companion flanges for circulating the well.
   → LOTO (lock-out/Tag-out) where required.
2. Complete slick-line work as required to set-up well for circulation.

WELLWORK PROGRAM

1. MIRU double w/o rig w/all equipment – pump, Baker tank, Shaker and mixer.
   - ➔ Perform JSA, JSP, CW

2. Spot 500 bbl Baker tanks and load well w/3% KCL water or 8.5 ppg.
   - ➔ Connect pump to the tubing and vent the casing through the choke manifold to the SoCal Gas withdrawal system.
   - ➔ Treat all brine with Biocide, 5 gals/100 bbls

3. Bull head HEC polymer into the liner and change over above TOL to 3% KCL since well is open to storage zone, in order to minimize loss circulation.
   - ➔ Pump at 2-3bpm MASP- 3625psig
   - ➔ Tubing volume is ~ 41 bbls., Annulus volume ~ 458 bbls.

4. Install backpressure valve in tubing hanger. ND wellhead and NU BOPE.
   - ➔ Send-in wellhead and tree components to Cameron for inspection.

5. Install a Class III 5M BOPE per Gas Company Standard 224.05 and in accordance with the DOGGR permit. All connections and valves must be flanged and at least 5000 psig rated.
   - ➔ Perform a 300 psig low pressure test on the annular preventer, blind rams and pipe rams for 20 minutes. Test all lines and connections to 300 psig.
   - ➔ Pressure test the Class III 5M annular preventer to 3500 psig for 20 minutes. Test blind rams and the 3-1/2" pipe rams to 5000 psig for 20 minutes. Test all lines and connections to 5000 psig.
   - ➔ All tests are to be charted and witnessed by a DOGGR representative.
   - ➔ Pull back pressure valve from tubing hanger.

6. Unset packer at 6766'. See tubing/production string details attached, un-latch from Otis "BWD" packer and POOH laydown production string.
   - ➔ Send tubing hanger to Cameron for rework from 3.5" to 4.5" tubing connection.
   - ➔ RIH w/ 9-5/8", 47# casing scraper (positive) on 2-7/8" work string to top of packer, POOH
   - ➔ If unable to unset packer assembly at 6766'. Mechanically cut pipe(tubing) at 6750'(+/- 15' above packer)

7. Mill Otis "BWD" packer at 6766' as required with 2-7/8", 6.5#, P-110 TKC work string. Note: will need to change pipe rams from 3-1/2" to 2-7/8".
   - ➔ Test 2-7/8" pipe rams prior to fishing

8. PU a 9-5/8", 47# casing scraper (positive) on 2-7/8" work string and RIH to top of liner at 6816'. Circulate well clean. POOH.

9. RIH with 2 - 3/8" hydrill c/o assembly for 5-1/2", 17# liner and RIH to c/o to bottom of liner at 7170' or as deep as possible. POOH.
   - ➔ NB: Temperature/Noise log run on 3/20/2016 tagged fill at 7160'.

10. MU and RIH w/ 9-5/8", 47# RBP on work string. Set at +/- 6806' (10' above liner top), fill hole and pressure test and sand off. POOH and lay down BP retrieving head.

- ➔ Test pressure - 1000 psi for 15minutes(see attached casing test schedule)
- ➔ If well does not test, notify engineer

11. Rig-up wireline unit(s) with lubricator as required to run the following logs:

    a) Gyro survey from BP to surface
    b) Ultrasonic imager from BP to surface
    c) Magnetic flux leakage BP to surface
    d) Multi-arm caliper log from BP to surface
    e) Cement bond log from BP to top of cement
    ➔ NB: Send copies of all logs to engineering team for review

12. RIH w/ 9-5/8", 47# test packer and run a Pressure Integrity Test on 9-5/8" casing from surface to BP to a minimum 115% of the wells maximum allowable operating pressure (3625 psi) as per attached Pressure Test Schedule. POOH with test packer.

13. Install BPV in tubing hanger. Nipple down 11" Class III 5 M BOPE, crossover spool, and primary pack-off.

    - ➔ Replace the pack-off seals and reinstall tubing head (11" 5M tubing head).
    - ➔ Install new wellhead and tree valves (13 - 5/8" 3M x 11" 5M DSA - casing head).
    - ➔ Pressure test all the wellhead seals to 3625 psig/ 80% of collapse pressure.
    - ➔ Reinstall the 11" Class III BOPE and function test. Retest all connection broken in process.

14. PU retrieving head for BP and RIH to 5' above top of sand. Circulate out sand. Release BP at +/- 6806'.
    - ➔ C/O w/weighted brine as required to control well.
    - ➔ POOH and lay down work string and RBP.

13. Change out rams 4.5", test BOPE and RIH w/new completion string as follows:
    a.) 4-1/2" 12.6# L-80 EUE 8RD wireline re-entry guide
    b.) 4-1/2" 12.6# x 9-5/8" 47# TCPC production packer(Aeroset)
    c.) 10' pup joint 4-1/2" 12.6# L-80 TCPC tubing
    d.) 4-1/2" 12.6# L-80 TCPC XN no-go nipple
    e.) Full joint 4-1/2" 12.6# L-80 TCPC tubing
    f.) 4-1/2" 12.6# L-80 TCPC sliding sleeve
    g.) Full joint 4-1/2" 12.6# L-80 TCPC tubing
    h.) 4-1/2" 12.6# TCPC Pin x 5-1/2" 20# TCPC Box Crossover pup joint
    i.) 5-1/2" 20# L-80 TCPC tubing to surface
    j.) Pup joints 5-1/2" 20# L-80 TCPC tubing for space-out
    k.) 4' 5-1/2" 20# L-80 TCPC fatigue nipple (pin x pin)
    l.) 10-3/4" tubing hanger with 4-1/2" EUE top box / 4" BPV / 5-1/2" TCPC bottom box

14. Land tubing on tubing hanger as per vendor specification at approximately the same depths as prior completion string. **Note: amount of compression to set on packer will be determined by Force Analysis / Tube Move Calculations.**

15. Rig-up slick line unit and lubricator. Set a plug in the 4-1/2" XN profile.

16. Notify DOGGR to witness pressure tests of annulus to 1000 psi. and tubing to 3700 psi. Both tests to be an hour in duration and recorded digitally.

17. Prep well to be unloaded after rig moves off.

18. RDMO

EQUIPMENTS / SERVICES

1. Workover Rig double [Ensign Rig 333 – Jeff Mosier, 6617060672]

2. HEC Polymer, Fluid [GEO drilling fluids – Gilbert Ortega, 6613312697]

3. Separator, well kill [Onyx – Dean Leal, 6614870492]

4. Tanks / trucking [Doby Haggar – Victor, 6615781453]

5. BOP/ packer/ Logging [Weatherford – Tim Ludeman, 8053202190]

6. Tubing string [Tuboscope – Nick Taminich, 8052906577]

7. Wellhead [Cameron – Danny Caraan, 6613038615]

WELL WORK PRPOGRAM TO UNLOAD WELL

1. RIH and shift the sliding sleeve open.

2. Rig-up nitrogen unit. Recover workover fluid by pumping down annulus taking returns up tubing.

3. RIH with slick line and shift sliding sleeve closed. POOH and rig down slickline unit.

4. Fill annulus with packer fluid including corrosion inhibitor & biocide.
   a.) Vent nitrogen returns as appropriate.
   b.) Monitor annulus fluid level and re-fill with packer fluid as necessary.

5. Install BPV in tubing hanger. Nipple down the Class III 5M BOPE and install the production tree and test to 5000 psig. Remove BPV.

6. Release production rig, rig down and move out.

WELL LATERAL HYDROTESTING

1. Per Gas Company Standard 182.0170, pressure test the tubing and casing kill laterals from the wellhead to the remote tie in to 3625 psig. Pressure test the tubing and casing withdrawal/injection laterals from wellhead to operating valves to 3625 psig.

2. Reinstall the hydro-tested laterals.

3. Install the well safety systems and instrumentation. Install pressure transmitters on tubing, casing, and surface casing.

4. Release well to operations.

EXTERNAL CORROSION PROTECTION

Per Gas Company Standard 167.30, remove any lead based paint and recoat wellhead, production tree, and laterals.

Current Tubing Detail as ran 12/9/1993

Quantity	Item	Length	Depth
1	KB	24.50	24.50
1	Hanger to ground	-3.20	21.30
1	Donut	0.53	21.83
1	3-1/2", EUE 8rd, N-80 pup jt	3.70	25.53
1	3-1/2", EUE 8rd, J-55 pup jt	10.13	35.66
1	3-1/2", EUE 8rd, J-55 pup jt	10.11	45.77
55	3-1/2", EUE 8rd, N-80 tbg.	1723.69	1769.46
165	3-1/2", EUE 8rd, J-55 tbg.	4889.55	6659.01
1	3-1/2", EUE 8rd, N-80 pup jt	4.00	6663.01
1	3-1/2", MMA Mandrel	8.15	6671.16
1	3-1/2", EUE 8rd, N-80 pup jt	0.62	6671.78
1	3-1/2", EUE 8rd, J-55 tbg.	30.00	6701.78
1	Sliding Sleeve	3.63	6705.41
1	3-1/2", EUE 8rd, J-55 tbg.	28.19	6733.60
1	"XN" No-Go Nipple	1.45	6735.05
1	3-1/2", EUE 8rd, J-55 tbg.	30.55	6765.60
1	J-Latch	0.40	6766.00
1	J-Latch inside	0.44	6766.44
1	Seal Units (2)	2.00	6768.44
1	Guide Shoe	1.88	6770.32

Casing Pressure Test Schedule:

Well: Porter 72A

		External Casing Backup Pressure			Pressure Test Net Burst Pressure @ Depth				Tubing Leak Net Burst Pressure @	Test Pressuree > 85% of Burst	Test Pressure < Tubing Leak - Net Burst (Gas-filled annulus)
Depth (TVD)	85% of Burst Strength	Fluid / Formation Pressure Gradient	External Casing Backup Pressure	Internal Water Hydrostatic	1	2	3	Final	Gas-Filled Annulus		
				Surface Test Pressure	3625			2250	3625		
				Test Packer Depth	3500						
				Test Down Casing or Tubing	Casing			Tubing			
				Bridge Plug Depth				6806			
0	5840	0.00	0	0	3625			2250	3625		
500	5840	0.00	0	221	3846			2471	3670		
1000	5840	0.00	0	442	4067			2692	3716		
1500	5840	0.00	0	663	4288			2913	3761		
2000	5840	0.00	0	884	4509			3134	3806		
2500	5840	0.00	0	1105	4730			3355	3852		
3000	5840	0.00	0	1326	4951			3576	3897		
3500	5840	0.00	0	1547	5172			3797	3942		
4000	5840	0.00	0	1768	-			4018	3988		
4500	5840	0.00	0	1989	-			4239	4033		
5000	5840	0.00	0	2210	-			4460	4078		
5500	5840	0.00	0	2431	-			4681	4123		
6000	5840	0.00	0	2652	-			4902	4169		
6500	5840	0.00	0	2873	-			5123	4214		
6806	5840	0.00	0	3008	-			5258	4242		
				0.442 psi/ft int. grad.					0.091 psi/ft int. grad.		

Rec'd 04-26-16 DOGGR Ventura.

Well

Porter 72A

API #: 04-037-24145-00
Sec 27, T3N, R16W

Operator: So. California Gas Co.

Lease: Porter
Field: Aliso Canyon
Status: Active Gas Storage
BFW:
USDW:

Ground Elevation: 1909.1' asl
Datum to Ground: 23.5' RT

Spud Date: 9/20/1993
Completion Date: 12/13/1993

Junk: None

13-3/8" TOC Surface
9-5/8" TOC Surface

17-1/2" Hole

Surface Casing
13-3/8", 54.5#, K-55
0' - 814'

CMT'D w/ 761 CF,
Good CMT Returns to Surface

814'

12-1/4" Hole

Production Casing
9-5/8", 47#, N-80
0' - 6899'

CMT'D w/ 2604 CF,
27 BBLS CMT Returns to Surface

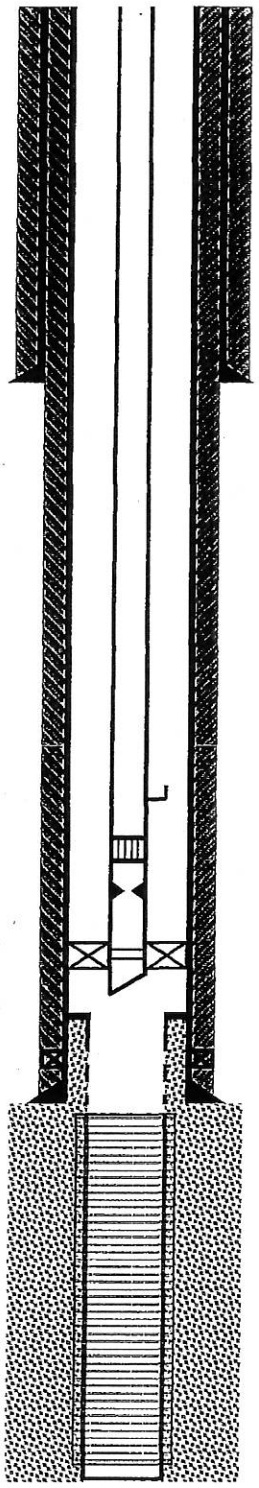
6816'

6899'

15" Hole

Liner
5-1/2", 17#, K-55
6816' - 7170'

7170'



Tubing
3-1/2", 9.3#
0' - 26' N-80
26' - 46' J-55
46' - 1769' N-80
1769' - 6659' J-55
6659' - 6672' N-80
6672' - 6770' J-55

6663' BST MMA GLM w/ 1-1/2" Dummy on 1-1/2" "RA" Latch

6702' Otis "XD" Sliding Sleeve

6734' Otis "XN" No-Go Nipple

6765.6' J-Latch (above PCKR)
6766' Otis "BWD" PCKR w/ (2) Seal Units
6766' J-Latch (In PCKR)
6770' Tail

6847' 9-5/8" CSG ECP Inflated w/ 104 CF CMT

Liner Perfs:
6841' - 6901' 1.5" x 0.012" Mesh, 12R, 6"C Slots
6901' - 7160' 0.012" Mesh WWS

Gravel Packed w/
344 CF (119% of Calc'd)
20-40, first 40 CF Resin Coated

Top of Zone Markers		
UDA1	5580'	(-3642')
MP	6588'	(-4646')
S1	6880'	(-4937')
S4	6966'	(-5023')
S8	7050'	(-5107')

TD 7170'
TD VSS (-5226')
Directionally Drilled: Yes (TD is 120' E, 277' S of Surf, 7159' TVD)

Prepared by: MAM (3/16/2016)

InterAct

Rec'd 04-26-16 DOGGR Ventura.

Well

Porter 72A

API #: 04-037-24145-00
Sec 27, T3N, R16W

Production Casing Pressure Test - Program

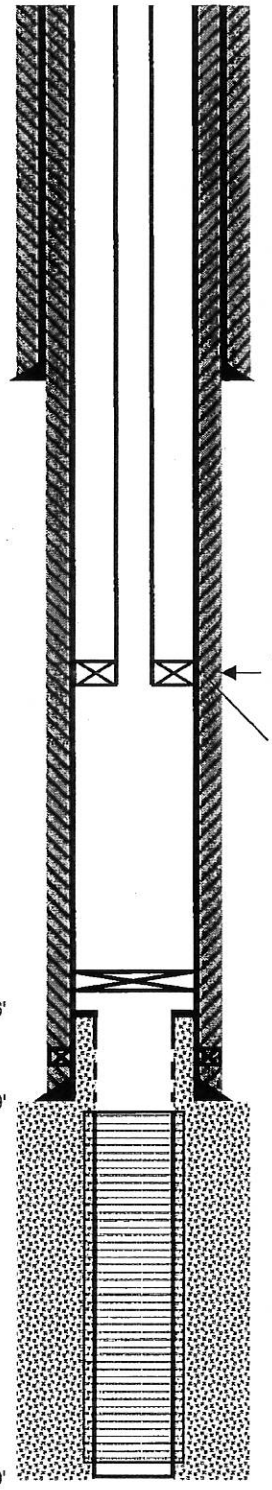
Operator: So. California Gas Co.

Lease: Porter
Field: Aliso Canyon
Status: Active Gas Storage
BFW:
USDW:

Ground Elevation: 1909.1' asl
Datum to Ground: 23.5' RT

Spud Date: 9/20/1993
Completion Date: 12/13/1993

Junk: None



Surface Casing
13-3/8", 54.5#, K-55
0' - 814'

CMT'D w/ 761 CF,
Good CMT Returns to Surface

TEST 3500' to Surface - 3625 psi
TEST 3500' to 6806' - 2250 psi

9-5/8" Test Packer (COE @ 3500')

Production Casing
9-5/8", 47#, N-80
0' - 6899'

CMT'D w/ 2604 CF,
27 BBLS CMT Returns to Surface

6806' 9-5/8" Retrievable Bridge Plug

6847' 9-5/8" CSG ECP Inflated w/ 104 CF CMT

Liner Perfs:
6841' - 6901' 1.5" x 0.012", 12R, 6"C Slots
6901' - 7160' 0.012" WWS

Gravel Packed w/
344 CF (119% of Calc'd)
20-40, first 40 CF Resin Coated

Liner
5-1/2", 17#, K-55
6816' - 7170'

Top of Zone Markers		
UDA1	5580'	(-3642')
MP	6588'	(-4646')
S1	6880'	(-4937')
S4	6966'	(-5023')
S8	7050'	(-5107')

TD 7170'
TD VSS (-5226')
Directionally Drilled: Yes (TD is 120' E, 277' S of Surf, 7159' TVD)

Prepared by: MAM (3/16/2016)
Updated by: LD (4/20/2016)

InterAct

Rec'd 04-26-16 DOGGR Ventura.